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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,079	06/25/2003	Leo Zhaoqing Liu	2006-441 Rhodia 02036	6545
27569	7590	04/01/2010	EXAMINER	
PAUL AND PAUL 2000 MARKET STREET SUITE 2900 PHILADELPHIA, PA 19103			WHITE, EVERETT NMN	
			ART UNIT	PAPER NUMBER
			1623	
			NOTIFICATION DATE	DELIVERY MODE
			04/01/2010 ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

INFO@PAULANDPAUL.COM  
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# Office Action Summary

Application No.

10/607,079

Applicant(s)

LIU ET AL.

Examiner

EVERETT WHITE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Replied

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2009.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 21-28, 39 and 40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-28, 39 and 40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. The amendment filed December 21, 2009 has been received, entered and carefully considered. The amendment affects the instant application accordingly:
  - (A) Claims 1-20 and 29-38 were previously canceled;
  - (B) Claims 21-28, 39 and 40 have been amended;
  - (C) Comments regarding the last Office Action have been provided drawn to:
    - (I) 103(a) rejection, rendered moot by new ground of rejection over newly cited rejection and US Patent.
2. Claims 21-28, 39 and 40 are pending in the case.

***Claim Rejections - 35 USC § 103***

***New Ground of Rejection***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 21, 23-27, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Restaino et al (US Patent No. 3,461,052, already of record).

Applicants amended the claims to now recite a method for grafting an unsaturated monomer onto a polysaccharide comprising the steps of: (1) forming a mixture comprised of an unsaturated monomer having a functional group selected from carboxylate, phosphonate, sulfonate and quaternary ammonium and a water soluble or water dispersible guar polysaccharide; (2) drying the mixture; and (3) irradiating the mixture with an amount of electron beam radiation sufficient to form an unsaturated monomer-water soluble or water dispersible polysaccharide guar graft copolymer, wherein the graft copolymer is depolymerized to a molecular weight lower than the molecular weight of the ungrafted guar polysaccharide, and the guar polysaccharide in the copolymer has a molecular weight of ~~no more than~~ between 100,000 and 700,000 Daltons. Additional limitations in the claims include specific unsaturated monomers.

The Restaino et al patent discloses a process for the production of graft substrates by ionizing radiation, wherein a hydrophilic polymeric substrate is irradiated in the presence of a solution of a monomeric vinyl compound (see abstract). See column 2, 1st paragraph wherein suitable substrates materials are listed, which include guar flour which meet the requirement of the guar recited in the instant Claims. Suitable vinyl monomers are listed in the 2nd paragraph of column 2, which include vinyl acetate, acrylic acid and its esters, methacrylic acid and its esters, acrylamide, acrylonitrile, styrene, vinyl toluene, vinyl pyridine, alkyl vinyl pyridines, divinyl benzene, butadiene, N,N-methylene bis-acrylamide, and the like, which meet the requirements of the unsaturated monomers disclosed in instant Claim 26. The Restaino et al patent also teaches using radiation to produce graft copolymers wherein the radiation may also be used to depolymerize the polymers. See column 3, 2nd paragraph wherein Restaino et al patent teaches that useful graft copolymers of polysaccharide degradation products

may be obtained by employing higher radiation doses. This paragraph also suggests using radiation to control the degree of degradation of a substrate, thus controlling the degree of molecular weight reduction, which embraces the molecular weight of the guar in the copolymer recited in instant Claim 21.

The instantly claimed method of grafting an unsaturated monomer onto a guar differs from the method of producing graft copolymers using radiation of the Restaino et al patent by specifically reciting a step wherein the mixture thereof is dried before being subjected to radiation.

However, such a drying step is inherently recited in the Restaino et al patent since the Restaino et al patent discloses subjecting radiation to substrates that have a moisture content that are obtained using the drying step of the instant claims. See column 2, lines 32-34 of the Restaino et al patent wherein it is disclosed that as little as 10% by weight of water on the substrate thereof markedly increases the rate of grafting, which appears to embrace the amount of water that may be present in the guar after the recited drying step in Claim 21. The disclosure of 10% by weight of water in the substrate thereof appears to embrace the drying step recited in instant Claim 21.

One having ordinary skill in the art would have been motivated to employ the process of the prior art with the expectation of obtaining the desired product because the skilled artisan would have expected the analogous starting materials to react similarly.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time of Applicants invention having the process of producing graft copolymers using radiation of the Restaino et al patent before him to carry out grafting of an unsaturated monomer onto guar as instantly claimed in view of their closely related structures and the resulting expectation of similar depolymerization properties.

5. Applicant's arguments with respect to Claims 21, 23-27, 39 and 40 have been considered but are moot in view of the new ground(s) of rejection.

***New Ground of Rejection***

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6. Claims 22 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Restaino et al (US Patent No. 3,461,052) as applied to Claims 21, 23-27, 39 and 40 above, and further in view of Chen et al (US Patent No. 6,939,536, newly recited).

Applicants claim a method for grafting an unsaturated monomer onto a guar, wherein the function group of the unsaturated monomer is a quaternary ammonium group.

The above description of the process for producing graft copolymers using radiation in the Restaino et al patent is incorporated into the current rejection.

The instantly claimed method of grafting an unsaturated monomer onto a guar differs from the method of producing graft copolymers using radiation of the Restaino et al patent by specifically claiming that the function group of the unsaturated monomer is a quaternary ammonium group.

The Chen et al patent shows that the present of a quaternary ammonium with guar is well known in art by disclosing in column 33, lines 51 and 52, a quaternary ammonium derivative of hydroxypropyl guar.

One of ordinary skill in this art would be motivated to combine the teaching of the Restaino et al patent with the teaching of the Chen et al patent since both documents disclose guar containing compositions that can be used in cosmetic products.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute for the functional group grafted on the guar of the Restaino et al patent with a quaternary ammonium derivative in view of the recognition in the art, as evidenced by the Chen et al patent, that a composition comprising quaternary ammonium derivative of hydropropyl guar is effective in treating keratin.

7. Applicant's arguments with respect to Claims 22 and 28 have been considered but are moot in view of the new ground(s) of rejection.

### ***Summary***

8. All the pending claims (Claims 21-28, 39 and 40) are rejected.

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***Examiner's Telephone Number, Fax Number, and Other Information***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Everett White whose telephone number is 571-272-0660. The examiner can normally be reached on 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia A. Jiang can be reached on 571-272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Everett White/

Examiner, Art Unit 1623

/Shaojia Anna Jiang/

Supervisory Patent Examiner, Art Unit 1623